

**ABSTRACT OF THE DISCLOSURE**

A photovoltaic device is employed to facilitate interactions between immobilized and dissolved biological materials. Such interactions including nucleotide hybridization, peptide-peptide interaction and peptide/nucleotide binding. Through the force of the photovoltaic effect, which is caused by illuminating the photovoltaic device with a light source, the efficiency of interaction between immobilized biomedical materials on the surface of the device and free biological materials is remarkably enhanced. Such photovoltaic device may be a microfabricated device having an array of microlocations capable of being used as a biological screening tool with high throughput applications.